



Blessing

t̄ CROSS-SECTION WITH JET PROBABILITY

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Outline

- What is new since preblessing.
- Questions & Answers.
- Plots and tables for blessing.

What is new since preblessing

- Found a bug in the computation of the mistag background after correction.
- Efficiency calculated now using the mistag matrix for signal events.
- Due to the observed E_T dependence of the mistag assymetry factor, we have assigned a new error.
 - ◊ Plot here!

QUESTIONS & ANSWERS

Questions & Answers

- **Q1:** Estimate QCD background using the intermediate region.
 - ◊ 1
 - ◊ 2

Questions & Answers

- Q2: Show numbers for Mistags and W+HF before and after the correction.
 - ◆ These numbers are shown for the 4 analyses in CDF note 7697 (tables 18, 19, 24, 25, 31, 32, 35 and 36). For the 1% single tag with analysis:

Jet Multiplicity	1 jet	2 jets	3 jets	≥ 4 jets
Before correction				
MC Derived	10.64 ± 1.30	16.53 ± 1.88	2.27 ± 0.28	0.71 ± 0.09
$Wb\bar{b}$	83.0 ± 23.4	46.5 ± 13.0	5.8 ± 1.6	3.2 ± 0.9
$Wc\bar{c}$	31.2 ± 9.3	17.2 ± 5.1	2.3 ± 0.7	1.16 ± 0.38
Wc	86.4 ± 21.4	18.3 ± 4.7	1.35 ± 0.37	0.57 ± 0.17
Mistag	149.7 ± 15.2	52.1 ± 5.2	8.6 ± 0.8	6.8 ± 0.7
Non W	30.5 ± 15.6	8.6 ± 4.6	0.91 ± 0.64	0.49 ± 0.49
Total Background	391.5 ± 48.2	159.2 ± 21.4	21.2 ± 2.7	12.9 ± 1.6
$t\bar{t}$ (6.1 pb)	1.7 ± 0.4	14.0 ± 1.8	27.5 ± 3.3	39.4 ± 4.6
Data	350	191	52	68
After correction				
MC Derived	10.64 ± 1.30	16.53 ± 1.88	2.27 ± 0.28	0.71 ± 0.09
$Wb\bar{b}$	83.0 ± 23.4	46.0 ± 12.9	4.19 ± 1.14	1.11 ± 0.32
$Wc\bar{c}$	31.2 ± 9.3	17.0 ± 5.1	1.6 ± 0.5	0.41 ± 0.13
Wc	86.3 ± 21.4	18.1 ± 4.6	0.98 ± 0.27	0.20 ± 0.06
Mistag	149.7 ± 15.2	51.8 ± 5.2	7.4 ± 0.7	4.3 ± 0.4
Non W	30.5 ± 15.6	8.6 ± 4.6	0.91 ± 0.64	0.49 ± 0.49
Total Background	391.4 ± 48.2	158.0 ± 21.2	17.4 ± 2.0	7.2 ± 0.8
$t\bar{t}$ (8.7 pb)	2.4 ± 0.5	20.0 ± 2.5	39.2 ± 4.7	56.2 ± 6.6

Questions & Answers

- Q3: Measure the inclusive muon W cross section

◊ ...

Questions & Answers

- **Q4:** Why your observed data for the one jet bin is below the total contribution while for SecVtx it is above? Compare backgrounds in one jet bin with SecVtx.

◊ The main difference comes from the mistag contribution. Our estimate is a factor 2 with respect to the one of SecVtx.

	SecVtx	JP < 1%
MC Derived	11.13 (2.61 %)	10.64 (3.04 %)
non W	37.23 (8.72 %)	30.5 (8.71 %)
Mistag	93.08 (21.80 %)	149.7 (42.77 %)
$Wb\bar{b}$	98.13 (22.98 %)	83.0 (23.71 %)
$Wc\bar{c}$	33.25 (7.79 %)	31.2 (8.91 %)
Wc	98.9 (23.16 %)	86.4 (24.69 %)
Observed data	427	350

- ◊ The mistag assymetry factor which is 1.57 for JP and 1.27 for SecVtx.
- ◊ The negative tag rate, in the 1 jet bin, is 0.8 for JP and 1.2 for SecVtx.

Questions & Answers

- **Q5:** A priori analysis
 - ◊ Single tag at 5%.
 - ◊ It has larger statistics and equal systematic uncertainty.
 - ◊ The systematic uncertainty is dominated by the SF error and the relative uncertainty on the SF is smaller for 5% than for 1%, compensating the larger systematis arising from larger backgrounds.

Questions & Answers

- Q6: Estimate the mistag contribution to the signal

◊ 1

Questions & Answers

- Q7: Split the analysis for electrons and muons

	Total	Electrons	Muonss
JP<1%			
Single	$8.7^{+1.1}_{-1.0} \pm 1.1$	$8.41^{+1.39}_{-1.23} \pm 1.06$	$9.09^{+1.66}_{-1.45} \pm 1.09$
Double	$11.3^{+2.4}_{-2.0} \pm 2.0$	$10.32^{+3.12}_{-2.43} \pm 1.83$	$12.68^{+4.00}_{-3.07} \pm 2.18$
JP<5%			
Single	$9.0^{+1.0}_{-0.9} \pm 1.1$	$8.91^{+1.36}_{-1.23} \pm 1.16$	$9.25^{+1.57}_{-1.39} \pm 1.13$
Double	$11.7^{+1.7}_{-1.5} \pm 2.0$	$10.65^{+2.25}_{-1.89} \pm 1.83$	$13.10^{+2.88}_{-2.39} \pm 2.18$

Questions & Answers

- **Q8:** Compare with SecVtx the background contribution in the double tag analysis

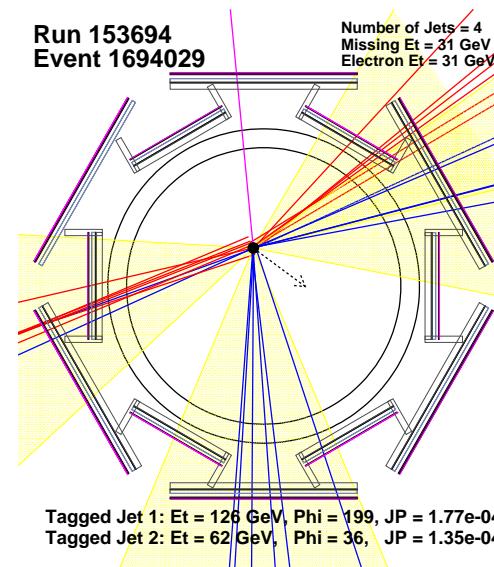
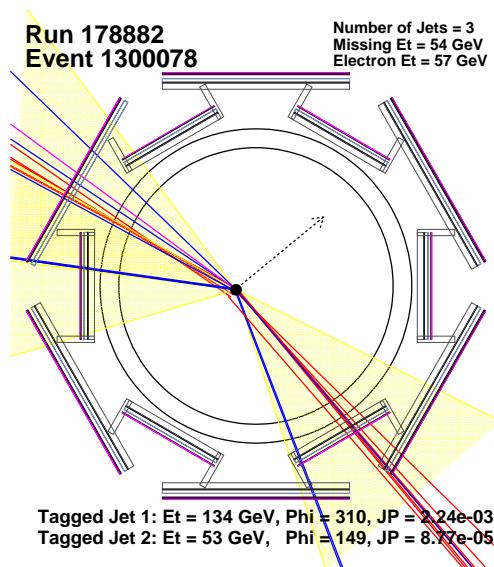
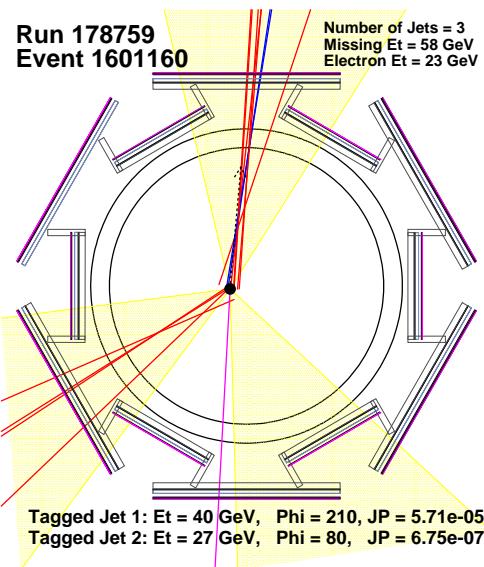
◊ ...

Questions & Answers

- **Q9:** Produce plots of all relevant jetprob tagging variables (in a similar style to the njet plot) using the measured cross section for the normalization
 - ◊ These plots are in appendix B

Questions & Answers

- **Q10:** Show "event displays" for your double tagged events as the Harvard group did.
 - ◊ These plots are in appendix C



Questions & Answers

- **Q11:** Why do you use uncorrected jet E_T for the parameterization? I guess it makes little difference in the end...
 - ◊ We use uncorrected jet E_T because this way the tag rate matrices can be used by everybody independently of the level of corrections they choose to make in their particular analysis.
 - ◊ This is the way both SecVtx and JetProb matrices have been defined (and blessed).
 - ◊ If the concern has to do with a slightly shifted E_T spectrum between the uncorrected jets used to parameterize the matrix and the jets used in the analysis, the short answer is indeed that it makes little difference, and the long answer was given at the blessing of the 5.3.3 Tag Rate Matrix.

Questions & Answers

- **Q12:** Scale factor vs. E_T is measured in inclusive electron and jet50 (herwig&pythia), then weighted average is taken as slope, and this slope is used to set a systematic. In the 5% jetprob cut, the slope comes out at more or less 0, whereas inclusive electron slope is 2 sigma negative, Jet50 pythia 2 sigma positive, and pythia within 1 sigma of 0. The chisquared of the combination isn't so small. Perhaps you should use a larger slope to set your systematic less aggressively?

- ◊ Table 1 in 7697 was quoting Gen4 numbers. It has been updated in the latest revision.

Sample	JP cut 1%	JP cut 5%
Incl. elec.	-0.0044 \pm 0.0056	-0.0062 \pm 0.0060
Jet 50	0.0005 \pm 0.0008	0.0004 \pm 0.0009
Weighted average	0.0004 \pm 0.0008	0.0003 \pm 0.0009

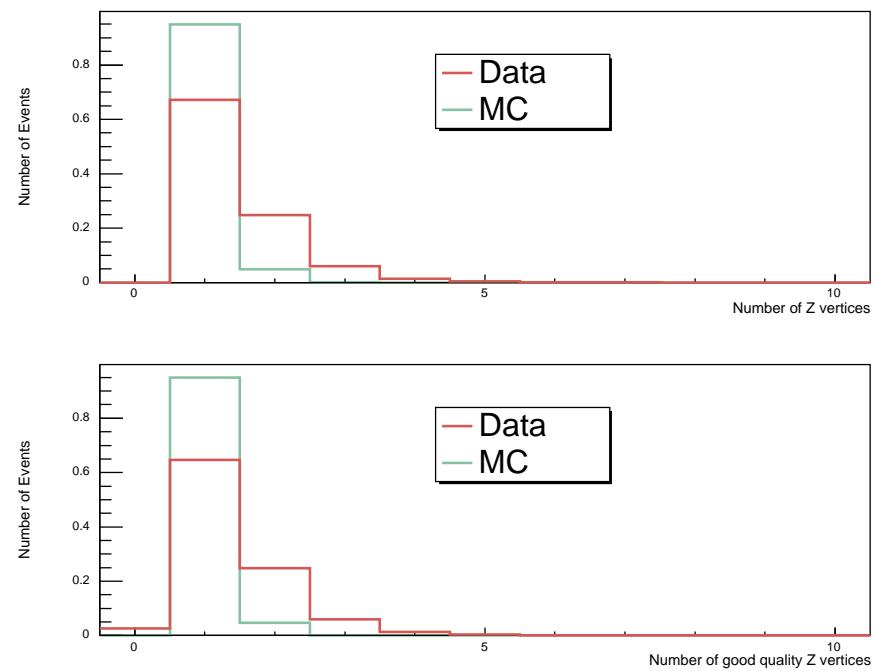
- ◊ In all cases we measure a slope which is consistent with zero. One measurement, however, is much more accurate than the other (because the Jet50 sample has much higher statistics at high E_T). We could either just keep the more accurate measurement, or take the weighted average, which in this case is almost the same thing. Setting the systematics this way does not seem so aggressive. Clearly the

Questions & Answers

difference between the two numbers is not a reasonable estimate of the uncertainty given the large difference in precision between them

Questions & Answers

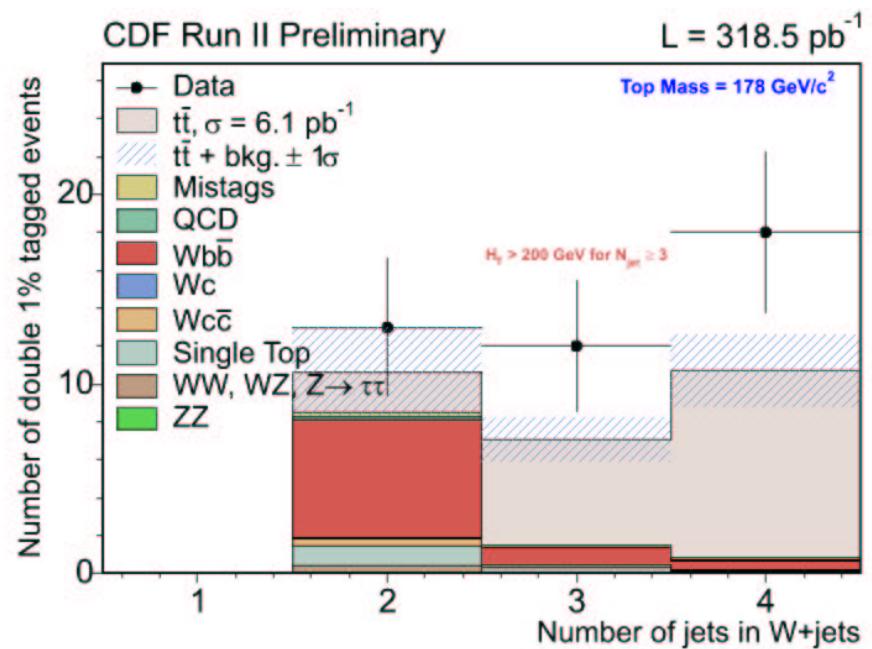
- Q13: Do you understand why the new 5cm vtx cut has different efficiencies in data/MC? Is it related to multiple interactions? Is the number of zvtx well described, for example?
 - ◊ Events lost in the data when applying this cut are events in which the vertex closest to the lepton track is farther than 5 cm (in z) from the highest ΣP_T vertex. This effect probably arises due to multiple interactions, for which we do not trust the MC would give an accurate description. Fortunately the efficiency of the cut is close to 100% for both data and MC so we do not worry about taking the difference between them as a systematic uncertainty.



Questions & Answers

- Q14: I guess figure 15 will look less frightening if you use a MC with $mt=174\dots!$

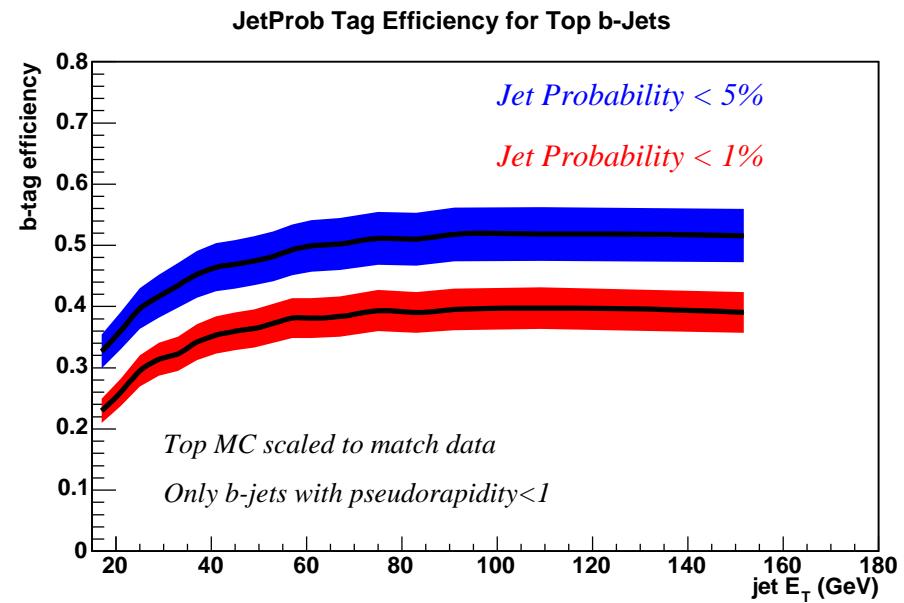
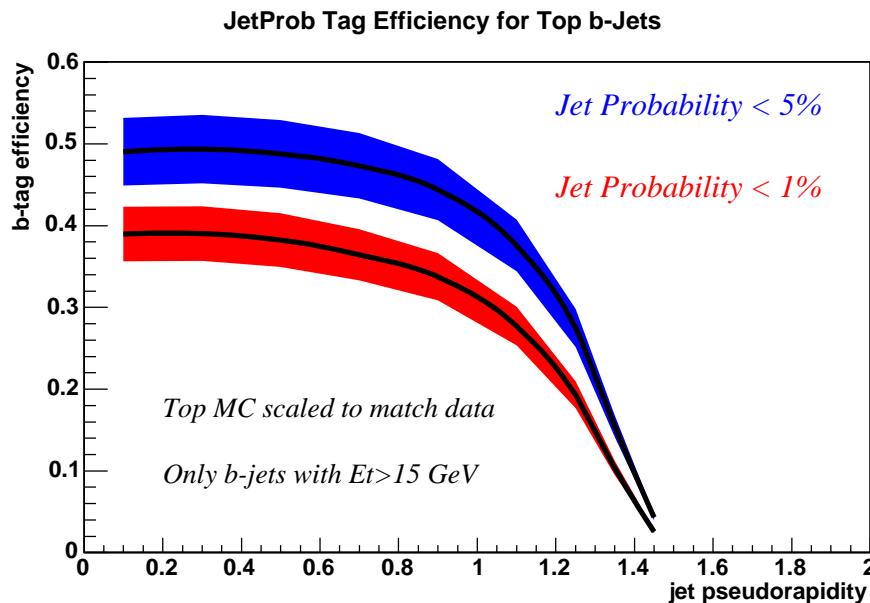
◊ The theoretical cross section for top masses near 175 GeV increases by about 0.2 pb for every GeV that the mass goes down. At $mt=174$ GeV the cross section is close to 6.9 pb. The plot would look slightly less scary, we would still be measuring a cross section higher than the theoretical prediction, but in both cases the excess is not statistically significant



FOR BLESSING

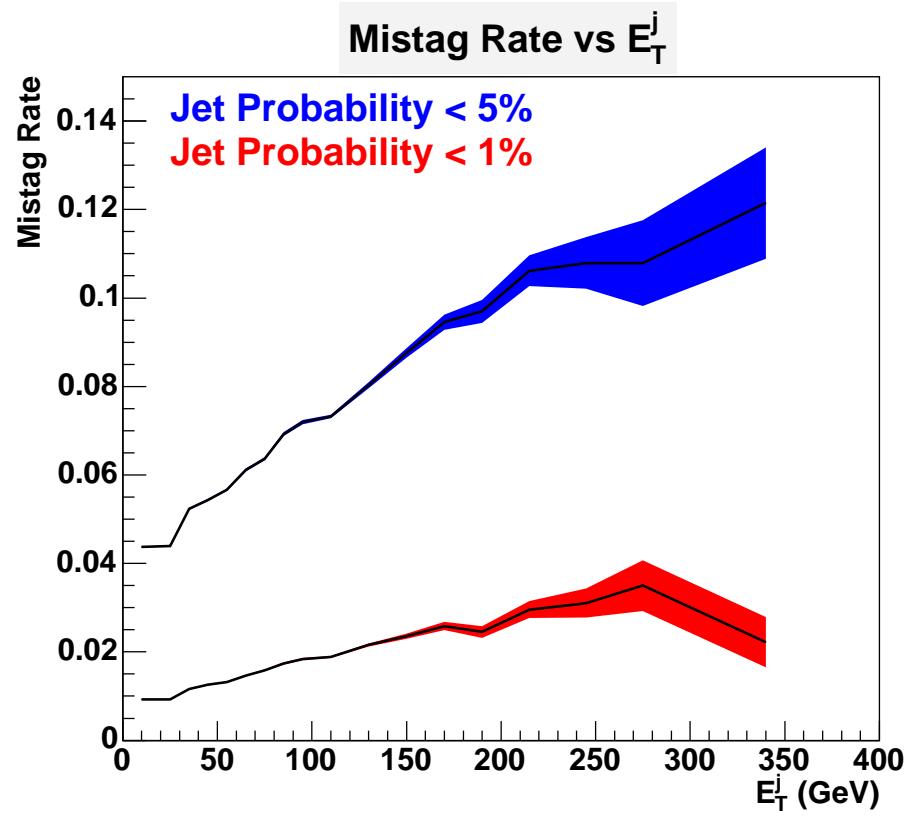
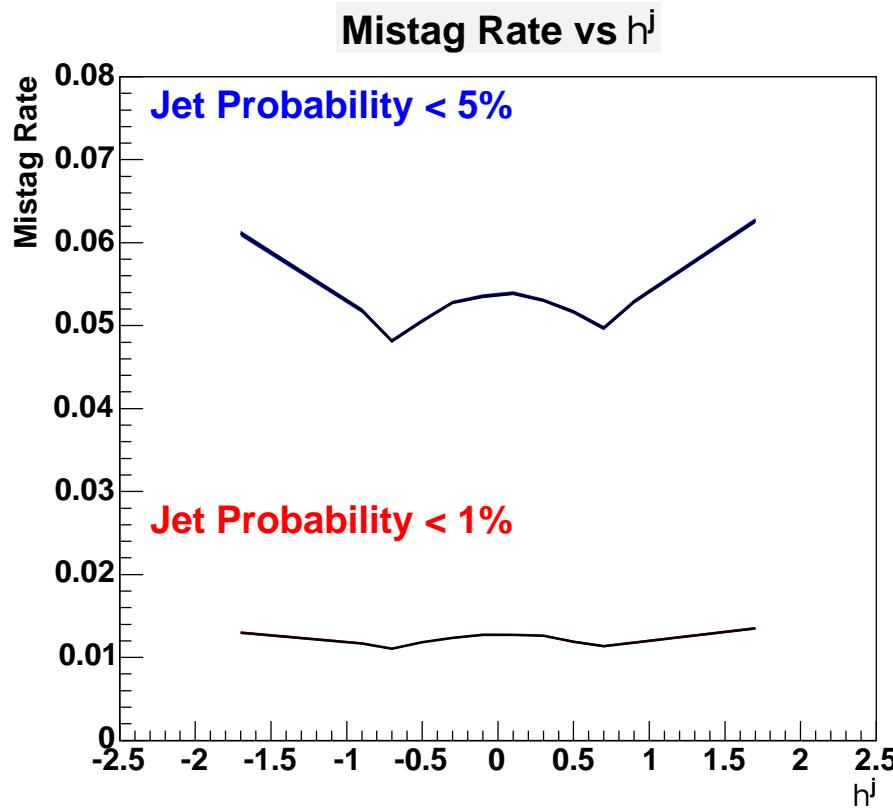
Jet Probability PR Plots: Efficiency

- Efficiency to tag jets in top quark Monte Carlo samples which have been matched to b quarks. The efficiency is obtained by multiplying the tag rate for such jets in the Monte Carlo by the data/MC scale factors. The bands represent the systematic error on the data/MC scale factors



Jet Probability PR Plots: Mistag Rate

- Jet Probability Mistag rate as a function of jet E_T and jet η . They are derived from an inclusive jet data sample which includes all of the 5.3.3 jet20, jet50, jet70 and jet100 datasets. The bands represent the statistical uncertainty



Yield of Events

Jet Multiplicity	1 jet	2 jet	3 jet	≥ 4 jets
Pretag events				
CEM	16897	2657	182	105
CMUP	8169	1175	83	44
CMX	4273	610	35	17
Total	29339	4442	300	166

Jet Mult.	1 jet	2 jets	3 jets	≥ 4 jets
Single tagged events ($JP < 1\%$)				
CEM	207	106	33	36
CMUP	92	58	13	24
CMX	51	27	6	8
Total	350	191	52	68

Jet Mult.	1 jet	2 jets	3 jets	≥ 4 jets
Single tagged events ($JP < 5\%$)				
CEM	571	230	53	53
CMUP	256	105	24	29
CMX	148	50	10	11
Total	975	385	87	93

Jet Mult.	2 jets	3 jets	≥ 4 jets
Double tagged events ($JP < 1\%$)			
CEM	8	7	9
CMUP	3	4	8
CMX	2	1	1
Total	13	12	18

Jet Mult.	2 jets	3 jets	≥ 4 jets
Double tagged events ($JP < 5\%$)			
CEM	16	15	18
CMUP	9	4	17
CMX	3	3	4
Total	28	22	39

Acceptances

Quantity	CEM	CMUP	CMX
Acc. No Tag Lum.(pb^{-1})	$3.665 \pm 0.017 \pm 0.279$ 318.5 ± 18.8	$1.919 \pm 0.011 \pm 0.147$ 318.5 ± 18.8	$0.751 \pm 0.008 \pm 0.057$ 318.5 ± 18.8
Single tag, JP<1% (SF = 0.817 ± 0.070)			
Tag Eff.	$54.46 \pm 0.21 \pm 3.60$	$53.87 \pm 0.27 \pm 3.56$	$54.94 \pm 0.47 \pm 3.58$
Average Tag Eff.		$54.31 \pm 0.16 \pm 3.58$	
Acc. with Tag $\epsilon_{t\bar{t}} \int L dt$	$2.00 \pm 0.01 \pm 0.20$ $6.36 \pm 0.04 \pm 0.74$	$1.03 \pm 0.01 \pm 0.11$ $3.29 \pm 0.03 \pm 0.39$	$0.41 \pm 0.01 \pm 0.04$ $1.31 \pm 0.02 \pm 0.15$
Double tag, JP<1% (SF = 0.817 ± 0.070)			
Tag Eff.	$12.46 \pm 0.13 \pm 2.05$	$12.32 \pm 0.17 \pm 2.02$	$13.16 \pm 0.30 \pm 2.16$
Average Tag Eff.		$12.49 \pm 0.098 \pm 2.05$	
Acc. with Tag $\epsilon_{t\bar{t}} \int L dt$	$0.457 \pm 0.005 \pm 0.083$ $1.45 \pm 0.02 \pm 0.28$	$0.236 \pm 0.003 \pm 0.043$ $0.75 \pm 0.01 \pm 0.14$	$0.090 \pm 0.002 \pm 0.018$ $0.31 \pm 0.008 \pm 0.060$
Single tag, JP<5% (SF = 0.852 ± 0.072)			
Tag Eff.	$68.5 \pm 0.2 \pm 3.8$	$68.3 \pm 0.3 \pm 3.8$	$69.2 \pm 0.4 \pm 3.8$
Average Tag Eff.		$68.5 \pm 0.1 \pm 3.8$	
Acc. with Tag $\epsilon_{t\bar{t}} \int L dt$	$2.51 \pm 0.01 \pm 0.24$ $7.99 \pm 0.04 \pm 0.89$	$1.31 \pm 0.01 \pm 0.12$ $4.18 \pm 0.03 \pm 0.47$	$0.519 \pm 0.006 \pm 0.049$ $1.65 \pm 0.02 \pm 0.18$
Double tag, JP<5% (SF = 0.852 ± 0.072)			
Tag Eff.	$23.9 \pm 0.2 \pm 3.6$	$23.5 \pm 0.2 \pm 3.6$	$24.4 \pm 0.4 \pm 3.8$
Average Tag Eff.		$23.8 \pm 0.1 \pm 3.6$	
Acc. with Tag $\epsilon_{t\bar{t}} \int L dt$	$0.88 \pm 0.01 \pm 0.15$ $2.79 \pm 0.02 \pm 0.50$	$0.45 \pm 0.01 \pm 0.08$ $1.44 \pm 0.02 \pm 0.26$	$0.183 \pm 0.004 \pm 0.031$ $0.583 \pm 0.011 \pm 0.106$

Summary Backgrounds (Single tag, JP<1%)

Jet Multiplicity	1 jet	2 jet	3 jet	≥ 4 jets
MC Derived Backgrounds				
WW	2.30 ± 0.30	4.79 ± 0.59	0.59 ± 0.09	0.30 ± 0.06
WZ	0.96 ± 0.12	1.95 ± 0.22	0.23 ± 0.04	0.07 ± 0.02
ZZ	0.027 ± 0.006	0.093 ± 0.014	0.013 ± 0.004	0.006 ± 0.003
Single top $W - g$	4.09 ± 0.50	4.93 ± 0.60	0.72 ± 0.09	0.20 ± 0.03
Single top W^*	1.32 ± 0.17	4.18 ± 0.49	0.60 ± 0.07	0.13 ± 0.02
$Z \rightarrow \tau^- \tau^+$	1.95 ± 0.42	0.59 ± 0.22	0.12 ± 0.09	0 ± 0
Total	10.64 ± 1.30	16.53 ± 1.88	2.27 ± 0.28	0.71 ± 0.09
W + Heavy Flavor				
W $b\bar{b}$	83.0 ± 23.4	46.5 ± 13.0	5.8 ± 1.6	3.2 ± 0.9
W $c\bar{c}$	31.2 ± 9.3	17.2 ± 5.1	2.3 ± 0.7	1.16 ± 0.38
W c	86.4 ± 21.4	18.3 ± 4.7	1.35 ± 0.37	0.57 ± 0.17
Total	200.6 ± 42.2	81.9 ± 19.5	9.4 ± 2.3	4.9 ± 1.3
Others				
Mistag	149.7 ± 15.2	52.1 ± 5.2	8.6 ± 0.8	6.8 ± 0.7
Non W	30.5 ± 15.6	8.6 ± 4.6	0.91 ± 0.64	0.49 ± 0.49
Total Background	391.5 ± 48.2	159.2 ± 21.4	21.2 ± 2.7	12.9 ± 1.6
$t\bar{t}$ (6.1 pb)	1.7 ± 0.4	14.0 ± 1.8	27.5 ± 3.3	39.4 ± 4.6
Data	350	191	52	68
After correction				
W $b\bar{b}$	83.0 ± 23.4	46.0 ± 12.9	4.19 ± 1.14	1.11 ± 0.32
W $c\bar{c}$	31.2 ± 9.3	17.0 ± 5.1	1.6 ± 0.5	0.41 ± 0.13
W c	86.3 ± 21.4	18.1 ± 4.6	0.98 ± 0.27	0.20 ± 0.06
Mistag	149.7 ± 15.2	51.8 ± 5.2	7.4 ± 0.7	4.3 ± 0.4
Total Background	391.4 ± 48.2	158.0 ± 21.2	17.4 ± 2.0	7.2 ± 0.8
$t\bar{t}$ (8.7 pb)	2.4 ± 0.5	20.0 ± 2.5	39.2 ± 4.7	56.2 ± 6.6

Summary Backgrounds (Double tag, JP<1%)

Jet Multiplicity	2 jet	3 jet	≥ 4 jets
MC Derived Backgrounds			
WW	0.060 ± 0.022	0.031 ± 0.015	0 ± 0
WZ	0.249 ± 0.052	0.0303 ± 0.0096	0.0117 ± 0.0055
ZZ	0.014 ± 0.004	0.00077 ± 0.00078	0.00077 ± 0.00078
Single top $W - g$	0.164 ± 0.033	0.121 ± 0.025	0.0443 ± 0.0099
Single top W^*	0.88 ± 0.17	0.138 ± 0.028	0.034 ± 0.007
$Z \rightarrow \tau^- \tau^+$	0.055 ± 0.056	0 ± 0	0 ± 0
Total	1.42 ± 0.28	0.320 ± 0.064	0.090 ± 0.019
W + Heavy Flavor			
$Wb\bar{b}$	6.1 ± 2.0	0.87 ± 0.28	0.51 ± 0.18
$Wc\bar{c}$	0.38 ± 0.17	0.13 ± 0.06	0.07 ± 0.04
Wc	0.12 ± 0.08	0.03 ± 0.03	0.019 ± 0.019
Total	6.6 ± 2.1	1.0 ± 0.3	0.6 ± 0.2
Others			
Mistag	0.213 ± 0.041	0.097 ± 0.019	0.118 ± 0.023
non W	0.19 ± 0.12	0.029 ± 0.018	0.045 ± 0.030
Total Background	8.5 ± 2.3	1.47 ± 0.37	0.85 ± 0.22
$t\bar{t}$ (6.1 pb)	2.2 ± 0.5	5.6 ± 1.1	9.8 ± 1.9
Data	13	12	18
After Correction			
$Wb\bar{b}$	6.1 ± 1.9	0.56 ± 0.18	0.079 ± 0.027
$Wc\bar{c}$	0.37 ± 0.17	0.083 ± 0.041	0.010 ± 0.006
Wc	0.117 ± 0.074	0.020 ± 0.017	0.003 ± 0.003
Mistag	0.21 ± 0.04	0.093 ± 0.018	0.104 ± 0.020
Total Background	8.4 ± 2.2	1.10 ± 0.25	0.33 ± 0.06
$t\bar{t}$ (11.3 pb)	4.0 ± 0.9	10.3 ± 2.0	18.2 ± 3.5

Summary Backgrounds (Single tag, JP<5%)

Jet Multiplicity	1 jet	2 jet	3 jet	≥ 4 jets
MC Derived Backgrounds				
WW	2.30 ± 0.30	4.79 ± 0.59	0.59 ± 0.09	0.30 ± 0.06
WZ	0.96 ± 0.12	1.95 ± 0.22	0.23 ± 0.04	0.07 ± 0.02
ZZ	0.027 ± 0.006	0.093 ± 0.014	0.013 ± 0.004	0.006 ± 0.003
Single top $W - g$	4.09 ± 0.50	4.93 ± 0.60	0.72 ± 0.09	0.20 ± 0.03
Single top W^*	1.32 ± 0.17	4.18 ± 0.49	0.60 ± 0.07	0.13 ± 0.02
$Z \rightarrow \tau^- \tau^+$	1.95 ± 0.42	0.59 ± 0.22	0.12 ± 0.09	0 ± 0
Total	10.64 ± 1.30	16.53 ± 1.88	2.27 ± 0.28	0.71 ± 0.09
W + Heavy Flavor				
W $b\bar{b}$	83.0 ± 23.4	46.5 ± 13.0	5.8 ± 1.6	3.2 ± 0.9
W $c\bar{c}$	31.2 ± 9.3	17.2 ± 5.1	2.3 ± 0.7	1.16 ± 0.38
W c	86.4 ± 21.4	18.3 ± 4.7	1.35 ± 0.37	0.57 ± 0.17
Total	200.6 ± 42.2	81.9 ± 19.5	9.4 ± 2.3	4.9 ± 1.3
Others				
Mistag	149.7 ± 15.2	52.1 ± 5.2	8.6 ± 0.8	6.8 ± 0.7
Non W	30.5 ± 15.6	8.6 ± 4.6	0.91 ± 0.64	0.49 ± 0.49
Total Background	391.5 ± 48.2	159.2 ± 21.4	21.2 ± 2.7	12.9 ± 1.6
$t\bar{t}$ (6.1 pb)	1.7 ± 0.4	14.0 ± 1.8	27.5 ± 3.3	39.4 ± 4.6
Data	350	191	52	68
After Correction				
W $b\bar{b}$	111.4 ± 31.4	59.0 ± 16.5	5.2 ± 1.4	1.25 ± 0.36
W $c\bar{c}$	67.9 ± 20.1	35.5 ± 10.5	3.18 ± 0.96	0.83 ± 0.26
W c	183.5 ± 45.2	37.7 ± 9.6	2.1 ± 0.6	0.50 ± 0.14
Mistag	584.7 ± 79.5	192.4 ± 26.2	22.9 ± 3.1	11.4 ± 1.6
Total Background	1034.9 ± 115.9	374.4 ± 42.7	38.7 ± 4.2	16.1 ± 1.9
$t\bar{t}$ (9.05 pb)	3.4 ± 0.6	26.7 ± 3.2	51.7 ± 5.9	73.4 ± 8.1

Summary Backgrounds (Double tag, JP<5%)

Jet Multiplicity	2 jet	3 jet	≥ 4 jets
MC Derived Backgrounds			
WW	0.060 ± 0.022	0.031 ± 0.015	0 ± 0
WZ	0.249 ± 0.052	0.0303 ± 0.0096	0.0117 ± 0.0055
ZZ	0.014 ± 0.004	0.00077 ± 0.00078	0.00077 ± 0.00078
Single top $W - g$	0.164 ± 0.033	0.121 ± 0.025	0.0443 ± 0.0099
Single top W^*	0.88 ± 0.17	0.138 ± 0.028	0.034 ± 0.007
$Z \rightarrow \tau^- \tau^+$	0.055 ± 0.056	0 ± 0	0 ± 0
Total	1.42 ± 0.28	0.320 ± 0.064	0.090 ± 0.019
W + Heavy Flavor			
$Wb\bar{b}$	6.1 ± 2.0	0.87 ± 0.28	0.51 ± 0.18
$Wc\bar{c}$	0.38 ± 0.17	0.13 ± 0.06	0.07 ± 0.04
Wc	0.12 ± 0.08	0.03 ± 0.03	0.019 ± 0.019
Total	6.6 ± 2.1	1.0 ± 0.3	0.6 ± 0.2
Others			
Mistag	0.213 ± 0.041	0.097 ± 0.019	0.118 ± 0.023
non W	0.19 ± 0.12	0.029 ± 0.018	0.045 ± 0.030
Total Background	8.5 ± 2.3	1.47 ± 0.37	0.85 ± 0.22
$t\bar{t}$ (6.1 pb)	2.2 ± 0.5	5.6 ± 1.1	9.8 ± 1.9
Data	13	12	18
After Correction			
$Wb\bar{b}$	6.1 ± 1.9	0.56 ± 0.18	0.079 ± 0.027
$Wc\bar{c}$	0.37 ± 0.17	0.083 ± 0.041	0.010 ± 0.006
Wc	0.117 ± 0.074	0.020 ± 0.017	0.003 ± 0.003
Mistag	0.21 ± 0.04	0.093 ± 0.018	0.104 ± 0.020
Total Background	8.4 ± 2.2	1.10 ± 0.25	0.33 ± 0.06
$t\bar{t}$ (11.3 pb)	4.0 ± 0.9	10.3 ± 2.0	18.2 ± 3.5

Statistical Uncertainties, JP < 1%

Source	Fractional Stat. Uncert.	Contribution to $\sigma_{t\bar{t}}$
Single tag, JP < 1%		
MC Acceptance	0.34%	0.34%
Mistag Matrix Prediction	0.51%	0.06%
Non-W Fraction	15.7%	0.13%
Non-W Prediction	44.4%	0.65%
W+HF Prediction	2.9%	0.26%
Other MC Background	4.3%	0.13%
Observed Data	+9.6%,-8.7%	+12.0%,-11.0%
Total Statistical Uncertainty		+12.1%,-11.0%
Double tag, JP < 1%		
MC Acceptance	0.34%	0.34%
Mistag Matrix Prediction	0.48%	0.003%
Non-W Fraction	15.7%	0.020%
Non-W Prediction	31.1%	0.080%
W+HF Prediction	8.1%	0.21%
Other MC Background	5.0%	0.072%
Observed Data	+20%,-16.7%	+21.0%,-17.5%
Total Statistical Uncertainty		+21.0%,-17.5%

Statistical Uncertainties, $JP < 5\%$

Source	Fractional Stat. Uncert.	Contribution to $\sigma_{t\bar{t}}$
Single tag, $JP < 5\%$		
MC Acceptance	0.34%	0.34%
Mistag Matrix Prediction	0.27%	0.075%
Non-W Fraction	15.7%	0.23%
Non-W Prediction	40.6%	0.68%
W+HF Prediction	2.5%	0.26%
Other MC Background	3.9%	0.17%
Observed Data	+7.7%,-7.2%	+11.1%,-10.3%
Total Statistical Uncertainty		+11.2%,-10.4%
Double tag, $JP < 5\%$		
MC Acceptance	0.34%	0.34%
Mistag Matrix Prediction	0.35%	0.012%
non-W Fraction	15.7%	0.039%
Non-W Prediction	22.4%	0.094%
W+HF Prediction	5.7%	0.17%
Other MC Background	4.9%	0.079%
Observed Data	+13.6%,-12.0%	+14.8%,-13.0%
Total Statistical Uncertainty		+14.8%,-13.0%

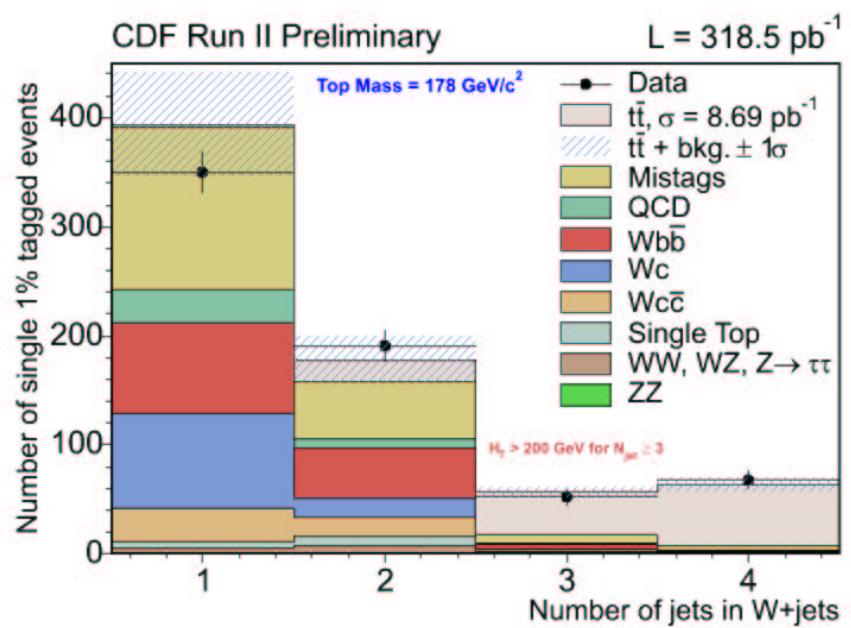
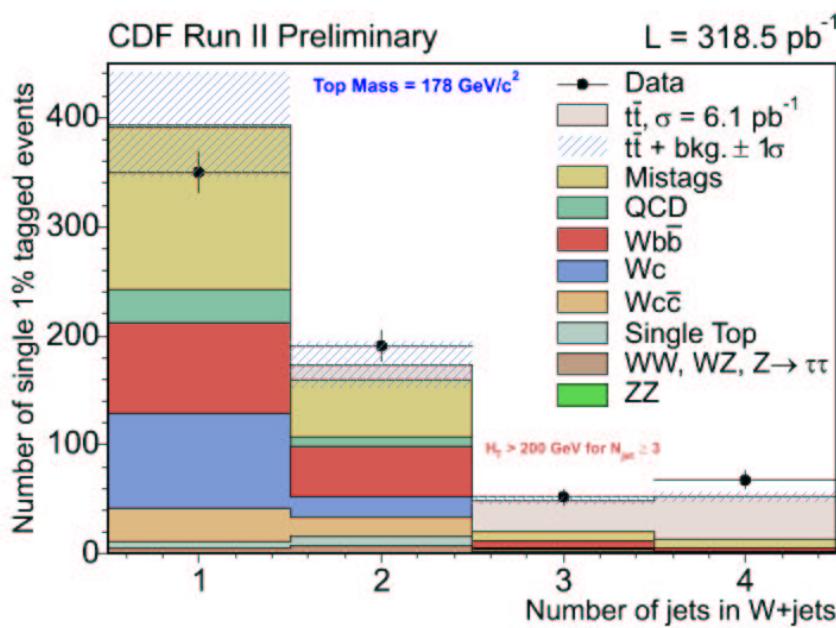
Syst. Uncertainties, $JP < 1\%$ (Single and Double tag)

Source	Fractional Syst. Uncert.	Contribution to $\sigma_{t\bar{t}}$
Central Electron ID	1.6% - 1.6%	0.97% - 0.96%
Central Muon ID	1.9% - 1.9%	0.61% - 0.60%
CMX Muon ID	1.8% - 1.8%	0.22% - 0.21%
PDF	2% - 2%	2.0% - 2.0%
Jet Energy Scale	4.2% - 4.2%	4.2% - 4.1%
Lepton Isolation	5% - 5%	4.9% - 4.8%
Initial and Final State Radiation	1.3% - 1.3%	1.3% - 1.3%
Monte Carlo Modeling	1.6% - 1.6%	1.6% - 1.6%
Z Vertex	2.0% - 2.0%	2.1% - 2.0%
Tagging Scale Factor (b's/c's)	8.6/12.9% - 8.6/12.9%	7.3% - 14.7%
Mistag Asymmetry	9.6% - 19.1%	1.2% - 0.13%
Non-W Fraction	50% - 50%	0.41% - 0.063%
Non-W Prediction	50% - 50%	0.74% - 0.13%
W+HF Prediction	30% - 30%	2.7% - 0.77%
Other MC backgrounds	1.8% - 1.8%	0.056% - 0.026%
Luminosity	5.9% - 5.9%	5.7% - 5.7%
Total Systematic Uncertainty		12.3% - 17.4%

Syst. Uncertainties, $JP < 5\%$ (Single and Double tag)

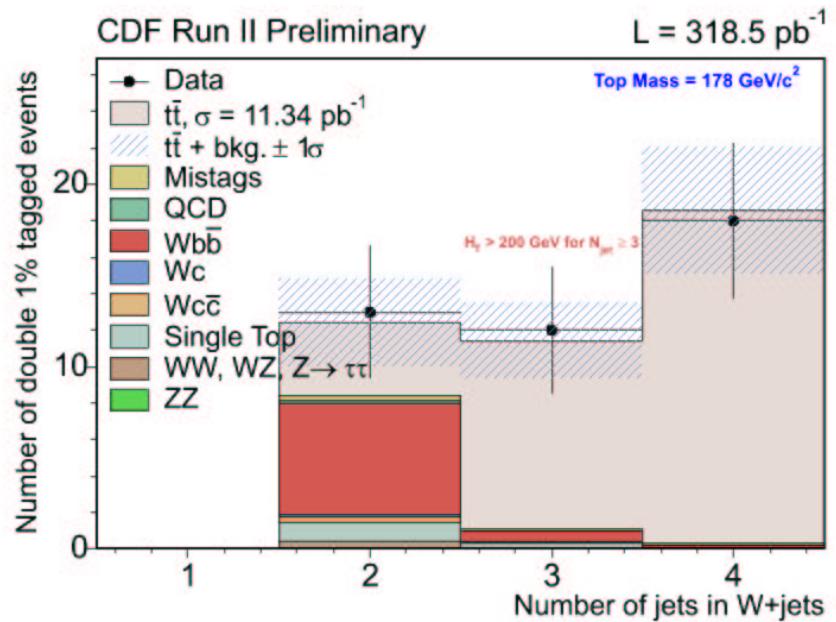
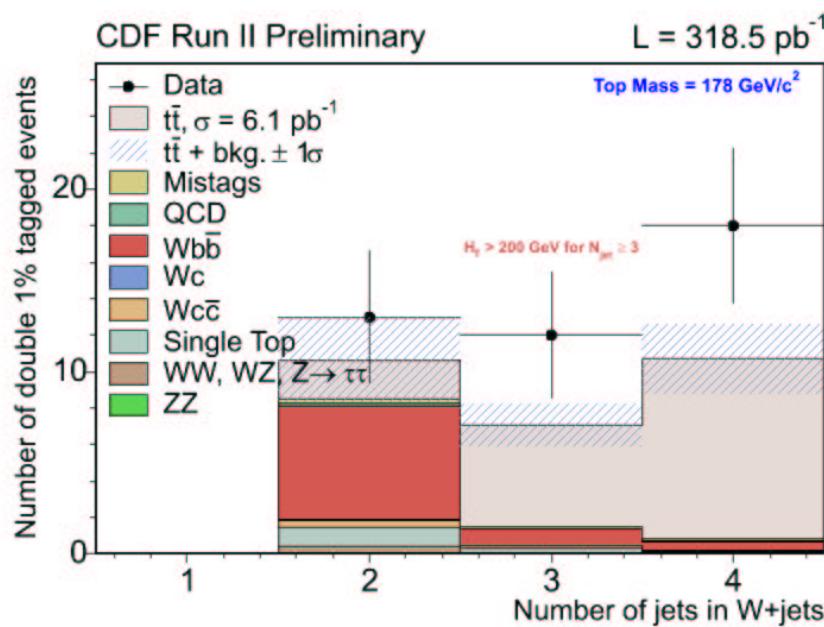
Source	Fractional Syst. Uncert.	Contribution to $\sigma_{t\bar{t}}$
Central Electron ID	1.6% - 1.6%	0.98% - 0.96%
Central Muon ID	1.9% - 1.9%	0.61% - 0.60%
CMX Muon ID	1.8% - 1.8%	0.22% - 0.21%
PDF	2% - 2%	2.0% - 2.0%
Jet Energy Scale	4.2% - 4.2%	4.2% - 4.1%
Lepton Isolation	5% - 5%	5.0% - 4.8%
Initial and Final State Radiation	1.3% - 1.3%	1.3% - 1.3%
Monte Carlo Modeling	1.6% - 1.6%	1.6% - 1.6%
Z Vertex	2.0% - 2.0%	2.1% - 2.0%
Tagging Scale Factor (b's/c's)	8.5/12.7% - 8.5/12.7%	6.6% - 14.0%
Mistag Asymmetry	13.4% - 26.8%	3.7% - 0.91%
Non-W Fraction	50% - 50%	0.73% - 0.12%
Non-W Prediction	50% - 50%	0.84% - 0.91%
W+HF Prediction	30% - 30%	3.1% - 0.90
Other MC backgrounds	1.8% - 1.8%	0.077% - 0.029%
Luminosity	5.9% - 5.9%	5.8% - 5.7%
Total Systematic Uncertainty		12.6% - 16.9%

Single Tag, $JP < 1\%$



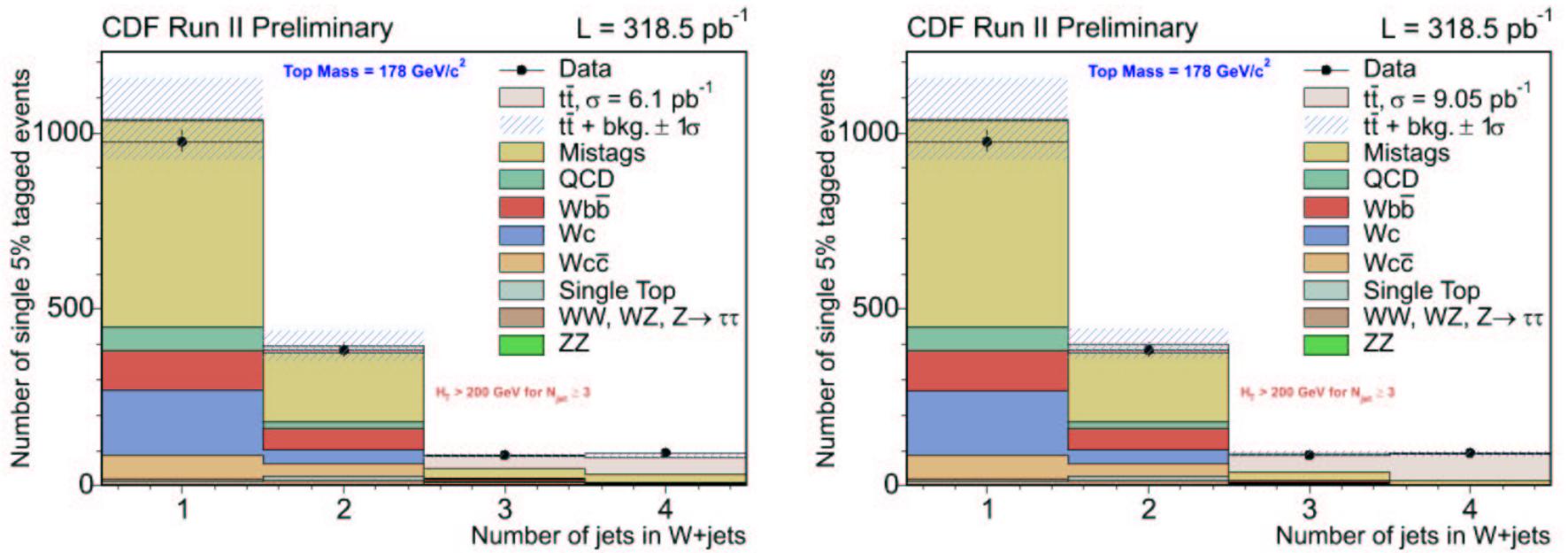
$$\sigma_{t\bar{t}} = 8.7^{+1.1}_{-1.0} \text{ (stat.)} \pm 1.1 \text{ (syst.) pb}$$

Double Tag, $JP < 1\%$



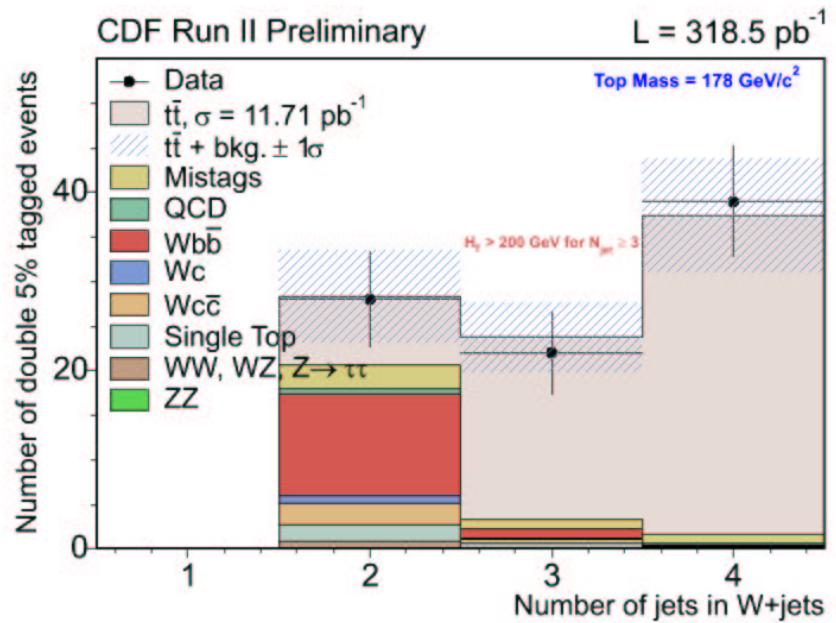
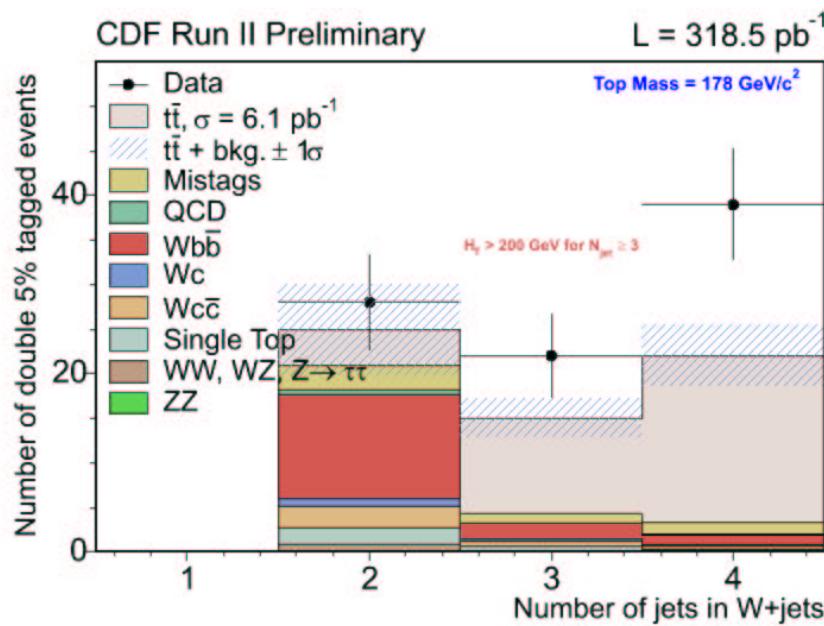
$$\sigma_{t\bar{t}} = 11.3^{+2.4}_{-2.0} \text{ (stat.)} \pm 2.0 \text{ (syst.)} \text{ pb}$$

Single Tag, $JP < 5\%$



$$\sigma_{t\bar{t}} = 9.0^{+1.0}_{-0.9} \text{ (stat.)} \pm 1.1 \text{ (syst.) pb}$$

Double Tag, $JP < 5\%$



$$\sigma_{t\bar{t}} = 11.7^{+1.7}_{-1.5} \text{ (stat.)} \pm 2.0 \text{ (syst.)} \text{ pb}$$